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Massachusetts

Appendix A

Resource Management Plan Legislation

Chapter 26 of 2003

Chapter 26 of 2003

AN ACT MAKING APPROPRIATIONS FOR THE FISCAL YEAR 2004 FOR THE MAINTENANCE OF THE DEPARTMENTS, BOARDS, COMMISSIONS, INSTITUTIONS AND CERTAIN ACTIVITIES OF THE COMMONWEALTH, FOR INTEREST, SINKING FUND AND SERIAL BOND REQUIREMENTS AND FOR CERTAIN PERMANENT IMPROVEMENTS.

Whereas, The deferred operation of this act would tend to defeat its purpose, which is immediately to make appropriations for the fiscal year beginning July 1, 2003, and to make certain changes in law, each of which is immediately necessary or appropriate to effectuate said appropriations or for other important public purposes, therefore it is hereby declared to be an emergency law, necessary for the immediate preservation of the public convenience.

SECTION 79. Said chapter 21, as so appearing, is hereby amended by striking out section 2F and inserting in place thereof the following section:

Section 2F. The directors of the divisions of state parks and recreation and urban parks and recreation shall work in cooperation with the director of the division of fisheries and wildlife within the department of fish and game to establish coordinated management guidelines for sustainable forestry practices on public forest lands within the departments of conservation and recreation and on private forest lands. Said guidelines for public forest lands shall include agreements on equipment, personnel transfers, operational costs, and assignment of specific management responsibilities.

The commissioner of conservation and recreation shall submit management plans to the stewardship council for the council's adoption with respect to all reservations, parks, and forests under the management of the department, regardless of whether such reservations, parks, or forests lie within the urban parks district or outside the urban parks district. Said management plans shall include guidelines for the operation and land stewardship of the aforementioned reservations, parks and forests, shall provide for the protection and stewardship of natural and cultural resources and shall ensure consistency between recreation, resource protection, and sustainable forest management. The commissioner shall seek and consider public input in the development of management plans, and shall make draft plans available for a public review and comment period through notice in the Environmental Monitor. Within thirty days of the adoption of such management plans, as amended from time to time, the commissioner shall file a copy of such plans as adopted by the council with the state secretary and the joint committee on natural resources and agriculture of the general court.

The commissioner of conservation and recreation shall be responsible for implementing said management plans, with due regard for the above requirement.

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Appendix B

Natural Resource Technical Appendices

Letter from NHESP of MA Division of Fisheries & Wildlife

Plant Community Composition

Potential and Actual Wildlife Utilization

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

June 6, 2005

Leslie Luchonok
Interim Director, Resource Management Planning Program
Department of Conservation and Recreation
136 Damon Road
Northampton, MA 01060

Re: Beaver Brook Reservation
Belmont, Lexington, and Waltham, MA
NHESP File: 05-17972

Dear Mr. Luchonok,

Thank you for contacting the Natural Heritage and Endangered Species Program ("NHESP") of the MA Division of Fisheries & Wildlife for information regarding state-protected rare species in the vicinity of the above referenced site. We have reviewed the site and would like to offer the following comments.

This project site is not located within a Priority Habitat or Estimated Habitat as indicated in the 11th Edition of the Massachusetts Natural Heritage Atlas. However, our database indicates that the following state-listed rare species have been found in the vicinity of the site:

Scientific name	Common Name	Taxonomic Group	State Status
Clemmys guttata	Spotted Turtle	Reptile	Special Concern

There are several vernal pools on the property and also several state-listed rare plants. These rare plant records are historical records and include *Oxalis violacea* (Violet Wood-sorrel), *Linum sulcatum* (Grooved Flax), and *Houstonia longifolia var. longifolia* (Long-leaved Bluet). These species are protected under the Massachusetts Endangered Species Act (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.37 and 10.59). Fact sheets for these species can be found on our website http://www.state.ma.us/dfwele/dfw/nhesp/nhfact.htm.

This evaluation is based on the most recent information available in the NHESP database, which is constantly being expanded and updated through ongoing research and inventory. Should your site plans change, or new rare species information become available, this evaluation may be reconsidered.

If you have any questions regarding this review please call Amanda Veinotte, Environmental Review Assistant, at ext. 154.

Sincerely,

Thomas W. French, Ph.D.
Assistant Director

Plant Community Composition (Source: LEC)

Upland Forest

Groundcover

Acer platanoides	Norway Maple
Acer saccharinum	Sugar Maple
Alliaria officinalis	Garlic Mustard
Amemone quinquefolia	Wood Amemone
Aralia nudicaulis	Sarsaparilla
Betula lenta	Black Birch
Carya spp.	Hickory
Castanea dentata	American Chestnut
Cheladonium majus	Celandine Poppy
Convallaria majalis	Lily-of-the-Valley
Dennstaedtia punctilobula	Hay-scented Fern
Dryopteris sp.	Wood Fern
Erythronium americanum	Trout Lily
Fagus grandifolia	American Beech
Fraxinus americana	Green Ash
Lonicera tatarica	Tatarian Honeysuckle
Lycopodium obscurum	Tree Clubmoss
Maianthemum canadense	Canada Mayflower
Pinus strobus	Eastern White Pine
Prunus serotina	Black Cherry
Pteridium aquilium	Braken Fern
Quercus alba	White Oak
Quercus rubra	Northern Red Oak
Quercus velutina	Black Oak
Rhamnus cathartica	Common Buckthorn
Rhamnus frangula	European Buckthorn
Smilacina racemosa	False Solomon's Seal
Trientalis borealis	Star Flower
Vaccinium angustifolium	Low-Bush Blueberry
Viburnum acerifolium	Maple-leaf Viburnum
Viola spp.	Violets

Shrub and Sapling Layer

Acer platanoides	Norway Maple
Berberis thunbergii	Japanese Barberry
Castanea dentata	American Chestnut
Lonicera tatarica	Tatarian Honeysuckle
Rhamnus cathartica	Common Buckthorn
Rhamnus fragula	European Buckthorn
Rosa multiflora	Multiflora Rose
Viburnum acerifolium	Maple-leaf Viburnum

Canopy

Acer saccharinum	Sugar Maple
Betula lenta	Black Birch
Carya spp.	Hickory
Fagus grandifolia	American Beech
Fraxinus americana	Green Ash
Pinus strobus	Eastern White Pine
Prunus serotina	Black Cherry
Quercus alba	White Oak
Quercus rubra	Northern Red Oak
Quercus velutina	Black Oak

Wet Meadow

Groundcover

Carex spp.	Sedges
Juncus spp.	Rushes
Lythrum salicaria	Purple Loosestrife
Phalaris arundinacea	Reed Canary Grass
Typha latifolia	Cattail

Upland Meadow

Canopy

Picea abies	Norway Spruce

Groundcover

Achillea millefolium	Yarrow
Agropyron repens	Quackgrass
Asclepias spp.	Milkweed
Festuca sp.	Fescue Grass
Hypericum spp.	St. John's Wort
Leucanthemum vulgare	Oxeye Daisey
Phleum pratense	Timothy Grass
Plantago lanceolata	Lance-Leaved Plantain
Plantago major	Common Plantain
Silene latiflora	White Campion
Tragopogon pratensis	Hawkweed

Successional Shrub Habitat

Shrubs and Sapling Layer

Acer platanoides	Norway Maple
Acer saccharinum	Sugar Maple
Alnus rugosa	Speckled Alder
Betula lenta	Black Birch
Carya spp.	Hickory
Castanea dentata	American Chestnut
Celastrus orbiculatus	Oriental Bittersweet
Cornus amomum	Silky Dogwood
Cornus florida	Flowering Dogwood
Cornus racemosa	Gray Dogwood
Elaeagnus umbellata	Autumn Olive
Fagus grandifolia	Beech
Fraxinus americana	Green Ash
Gleditsia triacanthos	Honey Locust
Juniperus virginiana	Red Cedar
Lonicera tatarica	Tatarian Honeysuckle
Pinus strobus	Eastern White Pine
Poplar spp.	Poplar
Prunus serotina	Black Cherry
Quercus alba	White Oak
Quercus rubra	Northern Red Oak
Quercus velutina	Black Oak
Rhamnus cathartica	Common Buckthorn
Rhamnus frangula	European Buckthorn
Rhus typhina	Staghorn Sumac
Robinia pseudoacacia	Black Locust
Rosa multiflora	Multiflora Rose
Spirea latifolia	Meadowsweet

Groundcover

Barbarea vulgaris	Yellow Rocket
Daucus carota	Wild Carrot
Plantago lanceolata	Lance-Leaved Plantain
Plantago major	Common Plantain
Polygonum sp.	Polygonum
Solidago spp.	Goldenrod
[GRAMINEAE]	Grasses

Forested Wetlands

Canopy

Acer rubrum	Red Maple
Fraxinus pennsylvanica	Green Ash
Ulmus americana	American Elm

Shrub

Clethra alnifolia	Sweet Pepperbush
Cornus amomum	Silky Dogwood
Ilex verticillata	Winterberry Holly
Lindera benzoin	Spicebush
Rhamnus frangula	European Buckthorn
Rhododendron vuscosum	Swamp Azalea
Vaccinium corymbosum	Highbush Blueberry
Viburnum dentatum	Arrowwood

Groundcover

Arisaema triphyllum	Jack-in-the-Pulpit
Carex spp.	Sedges
Geranium maculatum	Wild Geranium
Juncus spp.	Rushes
Kalmia angustifolia	Sheep Laurel
Onoclea sensibilis	Sensitive Fern
Osmunda cinnamomea	Cinnamon Fern
Osmunda claytoniana	Interupted Fern
Symplocarpus foetidus	Skunk Cabbage
Toxicodendron radicans	Poison Ivy

Emergent Marsh

Groundcover

Carex spp.	Sedges
Juncus spp.	Rushes
Lythrum salicaria	Purple Loosestrife
Phalaris arundinacea	Reed Canary Grass
Solidago spp.	Goldenrod
Typha latifolia	Cattail

Potential and Actual Wildlife Utilization (Source: LEC)

Upland Forest

Mammals

Canis latrans	Coyote
Eptesicus fuscus	Big Brown Bat
Erethizon dorsatum	Porcupine
Lasiurus borealis	Eastern Red Bat
Martes pennanti	Fisher
Mustela spp.	Weasel
Odocoileus virginianus	White-Tailed Deer *
Parascalops breweri	Hairy-Tailed Mole
Peromyscus leucopus	White-Footed Mouse *
Sciurus carolinensis	Gray Squirrel *
Tamias striatus	Chipmunk *
Tamiasciurus hundsonicus	Red Squirrel
Urocyon cinereoargenteus	Gray Fox

Reptiles

Clemmys guttata	Spotted Turtle
Diadophis punctatus	Northern Ring-Neck Snake
Thamnophis sauritus	Eastern Ribbon Snake

Amphibians

Ambystoma laterale	Blue-Spotted Salamander
Ambystoma maculatum	Spotted Salamander
Ambystoma opacum	Marbled Salamander
Hyla crucifer	Spring Peeper
Rana clamitans	Green Frog
Rana palustris	Pickerel Frog
Rana sylvatica	Wood Frog *

Birds

Accipiter cooperii	Cooper's Hawk
Accipiter gentilis	Northern Goshawk
Bubo virginianus	Great Horned Owl
Cardinalis cardinalis	Northern Cardinal *
Catharus guttatus	Hermit Thrush *
Colaptes auratus	Northern Flicker *
Contopus virens	Eastern Wood Pewee *
Corvus spp.	Crow *
Cyanocitta cristata	Blue Jay *
Empidonax minimus	Least Flycatcher
Hylocichla mustelina	Wood Thrush *
Junco hyemalis	Dark-Eyed Junco
Meleagris gallopavo	Wild Turkey
Mniotilta varia	Black and White Warbler *
Myiarchus crinitus	Great-Crested Flycatcher *
Parus atricapillus	Black-Capped Chickadee *
Parus bicolor	Tufted Titmouse *
Pheucticus ludovicianus	Rose-Breasted Grosbeak *
Picoides pubescens	Downy Woodpecker *
Picoides villosus	Hairy Woodpecker
Pipilo erythrophthalmus	Eastern Towhee
Piranga olivacea	Scarlet Tanager
Scolopax minor	American Woodcock
Seiurus aurocapillus	Ovenbird *
Sitta corolinensis	White-Breasted Nuthatch *
Turdus migratorius	American Robin *
Vireo olivaceus	Red-Eyed Vireo *
Wilsonia canadensis	Canada Warbler

** Species was Observed, Heard, or Evident via sign*

Forested Wetlands

Mammals

Blarina brevicauda	Short-Tailed Shrew
Condylura cristata	Star-Nosed Mole
Mustela spp.	Weasel
Napaeozapus insignis	Woodland Jumping Mouse

Birds

Archilochus colubris	Ruby-Throated Hummingbird *
Buteo lineatus	Red-Shouldered Hawk
Buteo platypteris	Broad-Winged Hawk
Butorides virescens	Green Heron
Catharus fuscescens	Veery *
Dumetella carolinensis	Catbird *
Empidonax minimus	Least Flycatcher
Geothylptis trichas	Common Yellowthroat
Nycticorax nycticoax	Black-Crowned Night Heron
Otus asio	Eastern Screech Owl
Parula americana	Northern Parula
Polioptila caerulea	Blue-Gray Gnatcatcher
Sayornis phoebe	Eastern Phoebe *
Seiurus noveboracensis	Northern Waterthrush *
Strix varia	Barred Owl
Thtyothorus ludovicianus	Carolina Wren *
Troglodytes troglodytes	Winter Wren

Reptiles

Clemmys guttata	Spotted Turtle
Diadophis punctatus	Northern Ring-Neck Snake
Thamnophis sauritus	Eastern Ribbon Snake

Amphibians

Ambystoma laterale	Blue-Spotted Salamander
Ambystoma maculatum	Spotted Salamander
Ambystoma opacum	Marbled Salamander
Hyla crucifer	Spring Peeper
Rana clamitans	Green Frog
Rana palustris	Pickerel Frog
Rana sylvatica	Wood Frog *

** Species was Observed, Heard, or Evident via sign*

Mill Pond and Duck Pond

Mammals

Eptesicus fuscus	Big Brown Bat
Lasionycteris noctivagans	Silver-Haired Bats
Lasiurus borealis	Eastern Red Bat
Lasiurus cinereus	Hoary Bat

Birds

Aix sponsa	Wood Duck *
Anas platyrhynochos	Mallard *
Anas rubripes	Black Duck *
Anas spp.	Teal
Branta canadensis	Canada Goose *
Ceryle alcyon	Belted Kingfisher
Chen caerulescens	Snow Goose *
Lophodytes cucullatus	Hooded Merganser
Parula americana	Northern Parula
Polioptila caerulea	Blue-Gray Gnatcatcher
Sayornis phoebe	Eastern Phoebe *
Vireo gilvus	Warbling Vireo

Reptiles

Chelydra serpentina	Snapping Turtle
Chrysemys picta	Painted Turtle

Amphibians

Notophthalmus viridescens	Red-Spotted Newt
Rana catesbeiana	Bull Frog
Rana clamitans	Green Frog

Arthropods

[DIPTERA]	Mosquitos *
[ODONATA]	Odonates *

** Species was Observed, Heard, or Evident via sign*

Successional Shrub Habitat and Meadow Habitats

Birds	
Agelaius phoeniceus	Red-Winged Blackbird
Archilochus colubris	Ruby-Throated Hummingbird *
Bombycilla cedrorum	Cedar Waxwing
Buteo jamaicensis	Red-Tailed Hawk
Caprimulgus vociferus	Whip-Poor-Will
Carduelis tristis	American Goldfinch *
Cathartes aura	Turkey Vulture
Chaetura pelagica	Chimney Swift
Chordeilis minor	Common Nighthawk
Circus cyaneus	Northern Harrier
Coccyzus erythropthalmus	Black-Billed Cuckoo
Dumetella carolinensis	Catbird *
Eremophila alpestris	Horned Lark
Falco sparverius	American Kestrel
Icterus galbula	Baltimore Orioles *
Lanius excubitor	Northern Shrike
Mimus polyglottos	Northern Mockingbird
Molothrus ater	Brown-Headed Cowbird
Nyctea scandiaca	Snowy Owl
Passerculus sandwichensis	Savannah Sparrow
Passerina cyanea	Indigo Bunting
Pheucticus ludovicianus	Rose-Breasted Grosbeak *
Quiscalusquiscula	Common Grackle
Sialia sialis	Eastern Bluebird
Spizella arborea	Winter Sparrow
Spizella passerina	Chipping Sparrow
Thtyothorus ludovicianus	Carolina Wren *
Toxostoma rufum	Brown Thrasher
Turdus migratorius	American Robin *
Tyrannus tyrannus	Eastern Kingbird
Zenaida macroura	Mourning Dove *

Mammals	
Canis latrans	Coyote
Marmota monax	Woodchuck
Mephitis mephitis	Striped Skunk
Microtus pennsylvanicus	Meadow Vole
Mustela spp.	Weasel
Sylvilagus floridanus	Eastern Cottontail
Vulpes vulpes	Red Fox
Zapus hudsonius	Meadow Jumping Mouse

Reptiles	
Coluber constrictor	Black Racer
Lampropeltis triangulum	Milk Snake
Opheodrys vernalis	Smooth Green Snake
Thamnophis sirtalis	Common Garter Snake

Amphibians	
Bufo americanus	American Toad *
Hyla crucifer	Spring Peeper
Notophthalmus viridescens	Red-Spotted Newt
Rana clamitans	Green Frog
Rana palustris	Pickerel Frog
Rana sylvatica	Wood Frog *

** Species was Observed, Heard, or Evident via sign*

Emergent Marsh Habitat

Mammals	
Microtus pennsylvanicus	Meadow Vole
Ondatra zibethicus	Muskrat
Procyon lotor	Raccoon
Zapus hudsonius	Meadow Jumping Mouse
Birds	
Agelaius phoeniceus	Red-Winged Blackbird *
Ardea alba	Great Egret
Butorides virescens	Great Blue Heron
Cistothorus palustris	Marsh Wren
Egretta thula	Snowy Egret
Gallinago gallinago	Common Snipe
Gallinula chloropus	Common Moorhen
Geothylptis trichas	Common Yellowthroat *
Melospiza georgiana	Swamp Sparrow
Melospiza melodia	Song Sparrow
Nycticorax nycticoax	Black-Crowned Night Heron
Porzana carolina	Sora
Rallus limicola	Virginia Rail
Seiurus noveboracensis	Northern Waterthrush *
Tachycineta bicolor	Tree Swallow *
Reptiles	
Chrysemys picta	Painted Turtle
Clemmys guttata	Spotted Turtle
Nerodia sipedon	Northern Water Snake
Sternothaerus odoratus	Musk Turtle
Storeria dekayi	Brown Snake
Thamnophis sauritus	Eastern Ribbon Snake
Amphibians	
Hyla crucifer	Spring Peeper
Rana catesbeiana	Bull Frog
Rana clamitans	Green Frog
Rana palustris	Pickerel Frog

** Species was Observed, Heard, or Evident via sign*

Flora and Fauna in Beaver Brook North Reservation (Source: MSH Reuse Plan)

Flora

Shrubs
Highbush blueberry
Arrowwood
Hazelnut
Dogwood
Buckthorn
Honeysuckle

Ground cover
Canada mayflower

Flowers
Pinl ladyslipper
True Solomon's seal
False Solomon's seal
Windflower
Bellwort
Wild pink

Trees
Oak
Hickory

Fauna

Reptiles and Amphibians
American toad
Wood frog
Spring peeper
Green frog
Red-backed salamander
Garter snake
Snapping turtle

Birds
Red-tailed hawk
Great horned owl
Eastern wood peewee
Great crested flycatcher
Wood thrush
Brown thrasher
Blue winged warbler
Scarlet tananger
Rose-breasted grosbeak
Indigo bunting
Solitary vireos

Mammals
Opossum
Little brown bat
Gray fox
Red fox
White-tailed deer
Eastern chipmunk
Short-tailed shrew
Striped skunk
Woodchuck
Eastern cottontail
Muskrat
Weasel
Raccoon

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Appendix C

Evaluation of Waltham's Golf Course Proposal

Evaluation of Waltham's Golf Course Proposal

Massachusetts Department of Conservation and Recreation
Revised January 10, 2006

Proposed golf course site, 2005

Introduction

The City of Waltham's proposed golf course is located on approximately 54 acres that were formerly part of the Metropolitan State Hospital (MSH).[1] Located approximately nine miles northwest of Boston, within a residential and institutional neighborhood the MSH site totals about 340 acres of fields, woodlands, wetlands, and over twenty buildings in the municipalities of Belmont, Lexington, and Waltham, bounded by Trapelo Road to the west and Concord Avenue to the east (Figure 1). The proposed nine-hole golf course was included in the MSH Reuse Plan (1994) after the property was declared surplus in 1992. While title to the 54-acre parcel went to the City of Waltham, the Department of Conservation and Recreation (DCR) holds a conservation easement that stipulates the land "will be retained in perpetuity predominately in its natural, scenic, and open condition for golf course and other conservation, recreational, conservation, and/or park uses … and to prevent any uses that will significantly impair or interfere with the recreation and conservation values thereof."[2]

The proposed golf course site is directly adjacent to both the original 59-acre Beaver Brook [Waverly Oaks] Reservation, and 254 acres of the MSH land that has been transferred to DCR as part of the newly expanded state reservation. This report evaluates the potential impacts of the proposed golf course development, and will form an appendix to the expanded Beaver Brook Reservation Resource Management Plan Report currently underway by Pressley Associates, Inc. and LEC Environmental Consultants. The primary purpose of the Golf Course Evaluation is to provide feedback to the DCR to assist them as they work with the City of Waltham on plans for the 54-acre site.

According to the Reuse Plan, the golf course design must mitigate all adverse environmental effects, including replication of any lost wetlands on the site. An 18-hole golf course was studied initially and found to have unacceptable impacts on wetlands and other environmentally sensitive areas in the site. As part of the transfer to the City of Waltham, the Reuse Plan also provides for a $600,000 payment to the DCR Urban Park Trust Fund, derived from the sale and dedicated to the operation and management of the expanded reservation.

Methodology

This evaluation has been prepared by Pressley Associates and LEC Environmental Consultants, Inc., (LEC). In particular, LEC's site evaluation inventoried the habitat communities and evaluated the extent of wildlife habitat contained within the 54-acres site. LEC conducted two site evaluations on May 17, and June 23, 2005 to traverse the property, inventory habitat communities, and evaluate their potential for wildlife habitat. LEC also reviewed appropriate maps and scientific literature to compare existing site conditions with wildlife

[1] The exact acreage for the golf course site varies slightly. Information from the DCR related to the scope of work for the RMP used a 54-acre figure, which is reflected in this evaluation. James M. Cortell and Associates, Inc., who prepared several studies for the City of Waltham use the figure of 56 (55.8) acres for the golf course site.

[2] "Conservation Easement by and between the City of Waltham and the Commonwealth of Massachusetts" (2002), 1-2.

habitats and ecological relationships documented under similar conditions throughout New England. While it was not LEC's purpose to inventory wildlife utilizing the site, prominent wildlife observations are noted. Based on the results of the site evaluation, LEC has determined that the site provides significant wildlife habitat resources for a variety of mammals, birds, reptiles, amphibians, and invertebrates, and contributes to the overall wildlife habitat value of the adjacent Beaver Brook Reservation including the former Metropolitan State Hospital land and other open space properties nearby. The information provided in this preliminary submittal will be expanded for the entire Reservation and included as a component of the RMP existing conditions chapter. Pressley Associates has also considered the golf course design for its functional and aesthetic value, and the potential effects of the golf course on the maintenance and management of the expanded reservation.

This evaluation is organized into four distinct sections:

I. Site description – including a general description of the 54-acre site, its geology and topography, and the current habitats including a discussion of specific habitat types, diversity, and open space context.

II. Evaluation of the proposed golf course design – includes a discussion of site suitability to the proposed golf course and other design issues.

III. Evaluation of potential site impacts – presents potential impacts (both positive and negative) related to public recreation, visual character, and ecological impacts.

IV. Conclusion – presents a summary of key points discussed in the evaluation.

Meadows along the entrance drive, 2005

Six site plans (Figures 1-6) illustrate the proposed golf course site, wetlands, vegetative cover, and three alternative layouts for the 9-hole course.

I. Site Description

The 9-hole golf course is proposed on 54 acres of the former MSH site owned by the City of Waltham facing Trapelo Road between Marguerite Avenue and Porter Road. The existing MSH entrance driveway leads from Trapelo Road to a circular roundabout in front of the existing Administration Building, bisecting the site proposed for the golf course. A new park drive located further northwest on Trapelo Road is currently under construction and will completely replace the original driveway, relocating the entrance.

Overall, the golf course site has vegetative buffer along Trapelo Road with openings at the entrance and Elsie Turner Field. Open meadow areas border the entrance drive on moderately undulating topography with scattered evergreen trees on the northern side. The open area south of the entrance is separated from Elsie Turner Field by a wooded area that forms part of the foot of Mackerel Hill. The ball field with gravel parking area is surrounded by wooded buffer on two sides, a private inholding, and Trapelo Road. The ball field has a back stop, two players' benches, one bleacher, and one trash drum.

Soft ball field at Elsie Turner Field, 2005

Adjacent to the south end of Elsie Turner Field, a small private inholding along Trapelo Road constricts the Waltham proposed golf course site, with a narrowed connection to the wooded area at the bottom of Mackerel Hill. This wooded area transitions into an open field that slopes up to the parking area of the Gaebler School. A portion of this parking area, with a panoramic view of Boston, is proposed to be part of the golf course. The Gaebler School driveway defines the southernmost boundary of the proposed golf course site.

Administration Building in the former Met State Hospital grounds, 2005

The northern most part of the site proposed for the golf course consists of a wooded area bordered by the Metropolitan State Hospital buildings, Trapelo Road, and Marguerite Avenue. A two-acre inholding is located the corner of Marguerite Avenue and Trapelo Road.[3]

According to the 1998 Cortell Associates Report, five Bordering Vegetated Wetlands (BVWs) are located in the proposed golf course study area with an additional BVW located north of the study area near Elsie Turner Field (Figure 2).

A portion of the expanded 254 acres of the former Metropolitan State Hospital, now part of the expanded Beaver Brook Reservation, borders the northeast side of the golf course site. In combination with other adjacent open space such as the Rock Meadow conservation land, McLean Hospital open space, Highland Farm (Mass Audubon), and Lexington conservation land, this "Western Greenway" represents a significant tract of contiguous, undeveloped land. Structures and infrastructure formerly associated with the Metropolitan State Hospital are located immediately north and southeast of the site, while residential development occurs to the southwest, southeast, and west.

The proposed golf course site is comprised of several diverse habitat types, including upland and wetland forest, successional field, and upland and wetland meadow including emergent marsh. A network of walking trails within the property and extending northerly into the adjacent Reservation provide passive recreational use.

Geology and Topography

The property's topography in relation to the surrounding landscape is depicted on Figure 3. The site contains a prominent drumlin, known as Mackerel Hill. Topography varies from gently-sloping to moderately steep relief, as the landscape descends from the drumlin towards the base of Mackerel Hill, which is a comparatively flat, ground moraine. Soils atop the drumlin are generally comprised of compact glacial till, while more friable soils are associated with the surrounding ground moraine. The ongoing construction of the Metropolitan Parkway has also revealed substantial bedrock on the site.

Habitat Types within the Proposed Golf Course Site

A variety of regionally common, but botanically diverse vegetated habitats are contained within the proposed golf course site, including forested upland and wetland, successional field, and upland and wetland meadow. A brief description of each of these is outlined below. The potential impacts to these habitats, resulting from the construction of the proposed golf course are discussed

Upland forest, 2005 (LEC)

Upland Forest

Two major upland forested areas comprise the southeastern and northwestern portions of the site. Maturing stands of Sugar Maple (*Acer saccharum*) dominate the canopy within the southeastern forest, while the northwestern forest is dominated by maturing Northern Red Oak (*Quercus rubra*). Both forests maintain understories varying in density and species composition and provide ideal habitat for a variety of forest-dwelling birds and mammals. Understory species observed include sapling canopy species, Maple-leaf Viburnum (*Viburnum acerifolium*), Black Huckleberry (*Gaylussacia baccata*), Buckthorn (*Rhamnus* spp.), Wild Sarsaparilla (*Aralia nudicaulis*), Celandine (*Chelidonium majus*), False Solomon's Seal (*Smilacina racemosa*), Wood Anemone (*Anemone quinquefolia*), and Bracken Fern (*Pteridium aquilinum*). Both upland forests vegetate drumlin hills and afforded multi-directional aspects, resulting in a range of sunlight penetration and hydrology. The maple forest has significant habitat connectivity to additional forest within the adjacent Reservation, while the oak forest maintains limited habitat connectivity to the Reservation via a narrow corridor of forest and emergent marsh along its northern edge.

[3] Shown as the Commonwealth of Massachusetts on the 2002 Metropolitan Parkway survey plans.

Wetland Forest

While the extent of forested wetland is limited to the central portion of the subject property, expansive areas of forested wetland occur northeast of the site within the Beaver Brook Reservation. The wetland forest is dominated by Red Maple (*Acer rubrum*), and varies from very swampy areas to more 'terrestrial' wetlands along the wetland edge. Understory plants include Sweet Pepperbush (*Clethra alnifolia*), Highbush Blueberry (*Vaccinium corymbosum*), Winterberry Holly (*Ilex verticillata*), Wild Geranium (*Geranium maculatum*), Skunk Cabbage (*Symplocarpus foetidus*), and Jack-in-the-Pulpit (*Arisaema triphyllum*). The wetland forest is the principle vegetation on the ground moraine surrounding the adjacent drumlin hills. Networks of intermittent streams and nearby water sources including an extensive emergent marsh system, Beaver Brook, and numerous Vernal Pools bolster the forested wetland's habitat value.

Successional Field

Successional fields are fallow areas that are populated by herbaceous plants, shrubs, and sapling trees. This habitat occurs east of the water tank, extending toward the southeastern State Hospital structure. Dominated by grasses and herbaceous plants, this habitat also includes scattered patches of sapling trees and shrubs, including Northern Red Oak, Black Locust (*Robinia pseudoacacia*), feral apples (*Malus* sp.), Red Cedar (*Juniperus virginiana*), and Dogwood (*Cornus* spp.). This unique habitat provides the habitat advantages of both forest and field, and provides significant 'edge' habitat preferred by many species of migratory birds, mammals, and reptiles. During the May 17, 2005 site evaluation, LEC encountered an inordinate number of Baltimore orioles within the successional field habitat, indicating that the golf course site likely functions as a stopover point for migrating birds.

Upland Meadow

The north-central portion of the property is comprised of a meadow containing a diverse variety of grasses and wildflowers, with scattered mature Norway Spruce (*Picea abies*) measuring 60 to 80 feet high: a significant landscape feature within the site. The majority of this meadow is comprised of upland species, including Timothy Grass (*Phleum pratense*), Fescue Grass (*Festuca* sp.), Quackgrass (*Agropyron repens*), English and Common Plantain (*Plantago lanceolata* and *P. major*), St. John's Wort (*Hypericum* spp.), Yarrow (*Achillea millefolium*), Milkweed (*Asclepias* spp.), Hawkweed (*Tragopogon pratensis*), White Campion (*Silene latiflora*), and Oxeye Daisy (*Leucanthemum vulgare*). While species utilizing the successional field will also occur within the upland meadow, the meadow habitat is more open with scattered towering spruce trees, providing the preferred hunting habitat for raptors. The upland meadow also provides nesting habitat for ground-nesting birds which generally require large tracts of open land.

Upland meadow, 2005 (LEC)

Wetland Meadow

Pockets of wetland meadow habitat occur along the forested wetland edge within the southern portion of the meadow, and along an intermittent stream channel that bifurcates the meadow immediately south of the Norway Spruce clusters. Patches of Reed Canary Grass (*Phalaris arundinacea*), Purple Loosestrife (*Lythrum salicaria*), Sedges (*Carex* spp.), Rushes (*Juncus* spp.), and cattail (*Typha latifolia*) primarily vegetate the wetland meadow. While this habitat is somewhat limited within the larger upland meadow, the stream provides a water source for wildlife and the differing plants provide a variety of food resources, particularly for red-winged blackbird (*Agelaius phoeniceus*), which were observed in abundance within adjacent emergent marsh habitat.

Wetland meadow, 2005

Habitat Diversity and Value

Three primary characteristics contribute to the golf course site's ability to provide significant wildlife habitat both locally and regionally, including habitat diversity, the extent of edge habitat, and the site's location in relation to other protected open space. While each of these site features is important individually, their benefit to wildlife is compounded when occurring within the same site.

Habitat Diversity

As discussed above, the site contains a variety of diverse habitats ranging from field to maturing forest. This habitat heterogeneity provides a variety of feeding, breeding, migratory, over-wintering, and cover resources for wildlife. Habitat diversity is directly related to species diversity, and contributes to complex arrangements of species interactions and relationships, as well as community stability. For example, the diversity of herbaceous plants contained within the meadow provides a varied array of resources for a host of herbivorous insects, including butterflies and moths [LEPIDOPTERA], grasshoppers [ORTHOPTERA], beetles [COLEOPTERA], and ants, wasps, and bees [HYMENOPTERA]. This variety of herbivorous insects provides a range of prey options for predatory insects, amphibians, reptiles, and birds. Species diversity at these lower trophic levels adds complexity to the food web, and gives rise to community stability.

Meadow and forest edge at the base of Mackerel Hill, 2005

Edge Habitat

Biological interactions tend to concentrate along habitat edges, or ecotones. While many species may prefer a specific habitat type, others have evolved to exploit the edges occurring along habitat boundaries. Two distinct ecotones associated with the site include upland/wetland edges and forest/meadow edges. While many ecotones occur along a linear interface (e.g. upland to wetland, forest to field), the successional field habitat described above provides extensive edge habitat over a large area, extending the wildlife benefits of the 'edge' to larger numbers of species.

The forest/field interface is the preferred predatory habitat for many raptor species, including hawks [ACCIPITRIDAE] and owls [STRIGIDAE]. The maturing trees provide perching habitat for the raptors as they search for prey within the field below. During the May 17, 2005 site evaluation, LEC observed a red-tailed hawk (*Buteo jamaicensis*) soaring over the upland meadow and perching within the Norway Spruce and adjacent oak forest. LEC also observed numerous small mammal burrows within the upland meadow, affirming that the forest/field edge within the property provides habitat for this predator/prey interaction.

Red-tailed hawk perched in Norway Spruce, 2005 (LEC)

Open Space Context

The contiguous open space system formed by the expanded Beaver Brook Reservation, former Metropolitan State Hospital land, and conservation lands in Waltham, Belmont, and Lexington represents a significant tract of undeveloped land within the Route 128 loop, particularly the area north of the Mass. Pike (I-90). The diversity of wetlands, watercourses, upland forest, and open meadow provide important habitat similar to the open space of the Blue Hills Reservation and Ponkapoag Bog located south of Boston, and the Middlesex Fells. Large tracts of undeveloped land are critical refuges for wildlife, particularly when encapsulated within urban and suburban environments. These areas provide critical stopover points for migrating birds, providing necessary food and cover resources. Furthermore, large tracts of specific habitat types such as forest, meadow, and emergent marsh provide critical interior spaces for reclusive wildlife species that can not thrive in smaller, fragmented habitats. Significant areas of maturing forest also provide a three-dimensional structure for biological interactions to occur, adding to the 2-dimenational 'area' of land we often consider.

Former Metropolitan State Hospital land, now part of the expanded Beaver Brook Reservation, 2005

II. Evaluation of the Proposed Golf Course Design

Alternatives

The initial designs for the golf course were developed by Carol R. Johnson Associates, Inc. (CRJA) as part of the MSH Reuse Plan process (1994). Based on the information provided by the DCR, including the Reuse Plan, it appears that CRJA developed at least five schemes for a 9-hole course on the 54-acre site. The DCR provided a 1"=100' plan by CRJA called Scheme #5 from a feasibility study for the Metropolitan State Hospital (Figure 4). Another alternative is incorporated into the Reuse Plan as Appendix C (Figure 5). A revised design by Philip A. Wogan of Wogan and Sargent, Inc. was subsequently evaluated by Cortell Associates in 1995 and used to determine the applicability of the Massachusetts Wetlands Protection Act related to existing wetlands on the site. This revised golf course design was also recorded in the latest electronic AutoCAD plans provided by DCR in June 2005. For these reasons, the design evaluation discussed below is based primarily on the revised plan by Philip Wogan (Figure 6). However, many of the issues that follow related to both design and environmental impacts will be similar for all of the alternative layouts.

Golf Course Design Evaluation

The proposed new park drive and entrance bisects the nine-hole golf course with five holes located north and four holes south of the driveway. The parkway leads to the proposed parking area for 100 cars and the existing MSH Administration Building, which will be rehabilitated as the club house with golf facilities. Trapelo Road is fairly well screened from the proposed golf course site by mature vegetation. The first hole is strategically located close to the club house, north of the entrance. Circulation through the 9-hole course is adversely affected by the entrance drive, which must be crossed twice during a game after holes 1 and 5.

South of the entrance driveway, the proposed golf course site covers approximately 3 acres of lower Mackerel Hill forest stand consisting of second-growth hardwood and some areas of early successional species of forest stand in Elsie Turner Park. This area will be cleared for holes 2, 3, 4, and 5, and the 15 feet wide cart paths. The ball field will be replaced with hole 5. In order to fit holes 3 and 4 into the sloping topography, they are located far from their adjacent holes 2 and 5, and the connecting path must negotiate the steep slopes of Mackerel Hill. Holes 3 and 4 will also require major re-grading of the existing topography, which has not yet been developed as design drawings. Routes between the holes south of the entrance will be confusing as they cross each other and do not follow a logical linear layout. Overall, the fairways for all nine holes are wider and the greens are larger than current standards.

Holes 1, 2, 5, 8, and 9 are located partially on wetlands and the fairways of holes 1, 2, 5, 8, and 9 and the green of hole 2 pass within wetland setbacks. This creates both an ecological and a design/permitting issue for the City. In addition, as discussed above, current construction activities on the site related to the new entrance drive (Metropolitan Parkway) have revealed substantial bedrock, which will likely affect the golf course construction as well.

While there may be alternative ways to redesign the course to reduce some of the aforementioned site issues, overall the 54-acre site with significant wetlands and topography is too constricted to accommodate the 9-hole course without substantial site alteration. Furthermore, Scheme #5 (Figure 4) and Appendix C (Figure 5) both indicates a total Par that is less than optimal for a 9-hole course. A comparison of typical vs. proposed standards for the Waltham course is summarized below.

Scorecard PAR / Number of holes	5	4	3	TOTAL
Proposed 9-hole Waltham course				
▪ Scheme #5	1	6	2	9 holes, Par 35
▪ Appendix C	0	7	2	9 holes, Par 34
Standards				
▪ Typical 9-hole course	2	5	2	9 holes, Par 36
▪ Executive course	0	4	5	9 holes, Par 31
▪ Par 3 course	0	0	9	9 holes, Par 27

III. Potential Impacts of the Proposed Golf Course Development

The following text describes potential positive and negative impacts associated with the proposed 9-hole golf course, based on the preliminary plans provided by the DCR, which indicate only a conceptual layout for the fairways and greens and do not include detailed information related to site grading, tree removal or replacement, or wetland mitigation. Furthermore, the location and distribution of bedrock is not known throughout the 54-acre site, which may substantially increase construction costs.[4]

Recreational Impacts

The proposed golf course will provide a new recreational amenity for the City of Waltham and a public golf course in the northwestern Boston suburbs. Given the size and configuration of the proposed course, it would be well-suited as a training course. Few of the adjacent or nearby communities have public courses. The closest public facilities are Pine Meadows in Lexington and the Fresh Pond course in Cambridge, although there are several private 18-hole courses within a short distance of the proposed site such as the Belmont Country Club, Stone Meadow in Lexington, and the Oakley Country Club in Watertown. This evaluation does not include a user-need study to determine the demand, feasibility, or cost of constructing the 9-hole course, and instead focuses primarily on its potential environmental impacts related to the 54-acre site and the adjacent state reservation.

Depending on the need and market, a public golf course can be a valuable recreational asset to the surrounding community. The 9-hole golf course is also proposed to allow public use in winter. Fairways on Mackerel Hill could be used for sledding, outdoor ponds used for skating, and the fairways and trails for cross-country skiing. However, the existing Waltham ball field will be lost in the process, reducing Waltham's available recreational fields. According to the City website, Waltham currently has 14 ball fields including Elsie Turner Field and 4 athletic fields. The parking area at Elsie Turner Field also functions as an access point for existing trails on Mackerel Hill. As a result, provisions for alternative trail access should be considered as part of the proposed golf course development.

In addition, the golf course will be both visually and physically accessible from trails within the adjacent Beaver Brook Reservation property. For this reason, the RMP alternatives will consider the relationship between existing or proposed trails within the expanded Reservation and the proposed golf course. For example, during the golf season, access to the fairways should be restricted to golfers only, as they pose a safety hazard for pedestrians.

Visual Impacts

The golf course will change the scenic views at the entrance to the former MSH, creating a more contrived and less naturalistic landscape. Given the tight arrangement of the fairways and the required grading, it is likely that most of the mature trees in the open areas of the site (such as the stand of Norway Spruce) will be lost along with the natural meadow landscape. The loss of wooded areas at the northern boundary and the foot of Mackerel Hill surrounding Elsie Turner Field will also alter the visual character of the site. Although moderate alterations are proposed to the existing undulating topography on the northern side of the entrance, the steeper slopes on the southern side of the golf course site will be subjected to terracing and/or re-grading to accommodate the proposed holes and fairways. Screening of the proposed golf course from the busy traffic on Trapelo Road requires supplemental planting to increase vegetative buffer along the boundary. At this time, it does not appear that a fence will be required along Trapelo Road because the line of play is generally parallel to the road and separated by mature trees.

Ecological Impacts

Although specific design plans that show the exact extent of grading, site disturbance, tree removal, protection of existing vegetation, new planting, and wetland mitigation have not yet been developed, it appears that the proposed golf course will result in substantial impacts to the site's existing habitats and plant communities.

Wetlands

Several wetlands are directly and adversely affected by the proposed golf course design as shown on Figure 2. The southern portion of the 2.3-acre Wetland 2 defined in the 1998 Cortell study is proposed to be part of hole 2. Wetland resources identified by Cortell within this wetland include a "Bordered Vegetated Wetland and Bank with palustrine emergent, scrub/shrub and forested areas on Swansea muck soil receiving hydrologic input from groundwater discharge and surface water from an intermittent channel that drains Wetland 3."

[4] Based on communication with DCR related to the current construction of the new entrance drive (Metropolitan Parkway).

Portions of the 1.1-acre Wetland 3 also defined by Cortell are proposed to be part of holes 2 and 5. Wetland resources identified by Cortell Associates include a "Bordered Vegetated Wetland and Bank with palustrine emergent and forested wetland on Udorthents and Montauk soils receiving hydrologic input from groundwater discharge, surface water runoff, overflow from the water tower atop Mackerel Hill, and discharge from a City of Waltham storm drain." Parts of this wetland are already disturbed by periodic mowing.

Portions of the 1.5 acre Wetland 4 are proposed to be part of holes 1, 8 and 9. Cortell identified this as a "Bordered Vegetated Wetland, Bank, and Land under Waterways with mainly turf grasses and limited wetland vegetation tolerant to periodic mowing on Swansea muck soil receiving hydrologic input from groundwater discharge, surface water runoff, and discharge from a City of Waltham storm drain." A perennial stream channel run the length of this wetland and enters a culvert that drains into Wetland 1.

Upland Forest

Areas in the northern section of the proposed golf course site contain upland oak forest, which will be substantially lost for greens, tees and fairways associated holes 6, 7, and 8. It is also likely, that construction access and grading will result in the loss of additional upland forest beyond the edges of the fairways. The Maple forest on the south side of Mackerel Hill will be substantially lost with the construction of holes 3 and 4 and terracing or re-grading required to fit the fairways onto the sloped topography.

Successional Field

A portion of the successional field located southeast of the water tank on Mackerel Hill is located within the Waltham site. It will likely be lost with the construction of fairways for hole 4.

Upland Meadow

The upland meadow located both north and south of the entrance drive/Metropolitan Parkway will be substantially altered with the construction of holes 1, 2, 5, 6, 8 and 9. This includes areas with scattered mature trees, the stand of Norway Spruce, and buffers to the emergent marsh that passes through the upland meadow. Most, if not all of the scattered mature trees in the meadow will be lost, and the native grasses and forbs will be replaced with a monoculture of species necessary to support the proposed golf course. Proximity to the wetland/emergent marsh, will make the fairways for holes 1, 2, 5, 6, 8 and 9 attractive to Canada geese, which will likely create an increased nitrogen load in the existing wetlands.

Habitat Value, Buffer, and Protection

In addition to providing large tracts of forest and meadow habitat, the proposed golf course site protects the natural communities in the adjacent Beaver Brook Reservation in several ways. First, the area provides a natural, 2000+/- foot wide buffer between the existing residential development located southwest of Trapelo Road and the Reservation. This large area, much of which is forested, buffers human induced noise and activity from sensitive species thriving in the habitat interiors. Further, the extensive forest and meadow vegetation within the proposed golf course site provides for flood control and pollutant attenuation.

While many view golf courses as 'green space' or 'open space' that function similarly to natural, undeveloped habitats, the maintained fairways and greens associated with golf courses lack the plant species diversity and dimensional structure that provide quality wildlife habitat occurring within naturally vegetated meadows and forest.

Constructing the golf course will require the removal of significant portions of the forested buffer and result in re-grading of the existing, well established forest, meadow, and successional field habitats which will be replaced by a monoculture of maintained, exotic grasses. The native soil will likely be removed or filled in places to accommodate the appropriate grades, altering burrowing and over-wintering habitat for amphibians, reptiles, and mammals. This alteration will also erode the quantity and quality of the habitat interior, and decrease the value of wildlife habitat associated with the site and the adjacent Reservation as a whole.

Last, the level of site disturbance required to construct the proposed golf course will make the property more vulnerable to invasive species such as Japanese Knotweed, Phragmites, European Buckthorn, and Purple Loosestrife that can easily out-compete the surviving native plants.

Management and Maintenance

The intensive maintenance of such large, manicured areas typically requires the continual use of heavy mowing equipment and the use of herbicides and pesticides. The ReUse Plan, particularly Amendment 2, stipulates that the proposed golf course be maintained using an IPM program and "green practices" to lessen the potential impacts to the Beaver Brook watershed and the adjacent Reservation. Since a

maintenance program is not yet developed for the property, it is unknown how, or to what extent the ecosystem will respond to the radical changes in character, re-grading, or new intensive maintenance practices. However, the proposed 9-hole golf course will require more landscape maintenance than the existing conservation use, including both routine landscape maintenance, the management of invasive species, and control of Canada geese.

A maintenance facility location and its requisite infrastructure is not delineated in the conceptual golf course plans, but would likely be needed to support daily maintenance and operation, including equipment and materials storage.

Management Recommendations

Proposed 9-hole Golf Course

The Metropolitan State Hospital Reuse Plan, particularly the 2nd Amendment does include specific parameters and guidelines for the management and maintenance of the proposed golf course, such as:

- Integrated pest management to minimize use of pesticides;
- Runoff from treated areas to be drained through vegetated buffer before reaching wetlands;
- Groundwater quality monitoring wells and groundwater level maintenance;
- Inventory and monitoring of aquatic invertebrate species; and
- Wildlife inventory.

The environmental study conducted by Cortell Associates suggested flagging and staking limits of disturbance for the tees, fairways, greens, and cart path in addition to locating staging and stockpile areas in unforested areas as protection measures for Mackerel Hill forest stand. If design work progresses on the proposed course, the following should be considered:

- The use of native species, particularly grasses and other herbaceous plants, placed in a naturalistic planting scheme so that the new course maintains some of the existing habitat and visual character;
- Narrowing the fairways and reconfiguring the course to avoid or reduce impact to wetlands;
- Reducing and minimizing the amount of re-grading and tree removal;
- Careful analysis of wetland impacts and mitigation; and
- Retaining as much natural vegetation as possible.

As discussed above, the alternatives addressed in the RMP should address visual and physical access to the golf course from the Reservation that both restricts use during active golf play and provides for an integrated experience for cross-country skiing in the winter.

Conservation Land

If the 54-acre site is preserved as conservation land, LEC has the following recommendations for land management:

- Existing meadow habitat and field portions of successional field should be mowed every 2 to 3 years in order to maintain open habitat characteristics;
- Invasive species, while not taking over portions of the site, are present in localized pockets and should be managed appropriately (e.g. black locust, purple loosestrife, common buckthorn, etc.);
- Passive recreation (e.g. walking trails, etc.) should be encouraged within a network of limited existing trails to minimize anthropogenic influence on sensitive species.

Conclusion

The proposed 9-hole golf course for the City of Waltham's 54-acre property on Trapelo Road, adjacent to the expanded Beaver Brook Reservation would provide a new public recreational amenity for the City. However, the construction of the 9-hole course on a site with substantial topographic change (Mackerel Hill), wetlands, and valuable plant communities would likely result in substantial site disturbance and the loss of mature trees, meadow and wetland habitats, and Waltham's existing ball field at Elsie Turner Field. This is largely because this site is too small to allow for creative design solutions that could minimize disturbance and protect significant site amenities. In contrast,

the George Wright Golf Course maintained by the City of Boston achieves its scenic character through fairways separated by substantial buffers of Oak woodland, but achieves this on over 150 acres for 18 holes.

Should the City of Waltham decide to pursue additional design development for the proposed 9-hole golf course, additional alternatives or modifications should be considered to narrow the fairways to maximize retention of existing vegetation, as well as considering a shorter course. Additional information is also needed to more fully evaluate the amount of re-grading necessary to accommodate the greens, fairways and tees so that a better understanding of the total site impact is possible.

The existing 54-acre site also functions as an important buffer to the natural communities contained within the expanded Beaver Brook Reservation. Loss of the habitat, plant communities, and alterations to the wetlands within the proposed golf course site will likely have a slow and gradual adverse affect on the quality of the plant communities within the state reservation, resulting from an influx of invasive and/or exotic specifies and increased nutrient levels in the wetland system.

A summary evaluation of alternative uses (9-hole golf course vs. conservation land) is included below.

Alternative Use	Public Benefit	Site Impacts and Issues
City of Waltham 9-hole Golf Course	▪ Presents an opportunity for a 9-hole public golf course that could function as a training course. ▪ Golf course could be used for cross-country skiing in winter and passive recreation when the course is not is use. ▪ Parking facility and clubhouse could provide space for visitors to the reservation, including restrooms and orientation/interpretation in the building.	Most impact ▪ Construction will result in the removal of the forested buffer and alterations to the forest, meadow, and successional field habitats, which will be replaced by a monoculture of exotic grasses. ▪ Re-grading the landform will result in the removal of native soil and the introduction of additional fill to accommodate the appropriate grades, altering burrowing and over-wintering habitat for amphibians, reptiles, and mammals. ▪ Site alterations will erode the quantity, quality, and value of the wildlife habitat and the natural buffer to the adjacent Reservation. ▪ Use of the site as a 9-hole golf course may appeal to a more limited constituency. ▪ Greens and tee's may require irrigation, fertilization, drainage and intensive turf management. ▪ Golf course use will result in the loss of Elsie Turner ball field.
Conservation Land	▪ Preserves additional natural area in the Western Greenway. ▪ Has the least affect of adjacent residential areas as well as traffic and safety along Trapelo Road. ▪ Conservation land could include selective new trails and small parking area, providing year-round public access that is compatible with the natural environment.	Least impact ▪ Presents the opportunity for holistic site management to enhance wildlife habitat through an organized mowing program and invasive species management.

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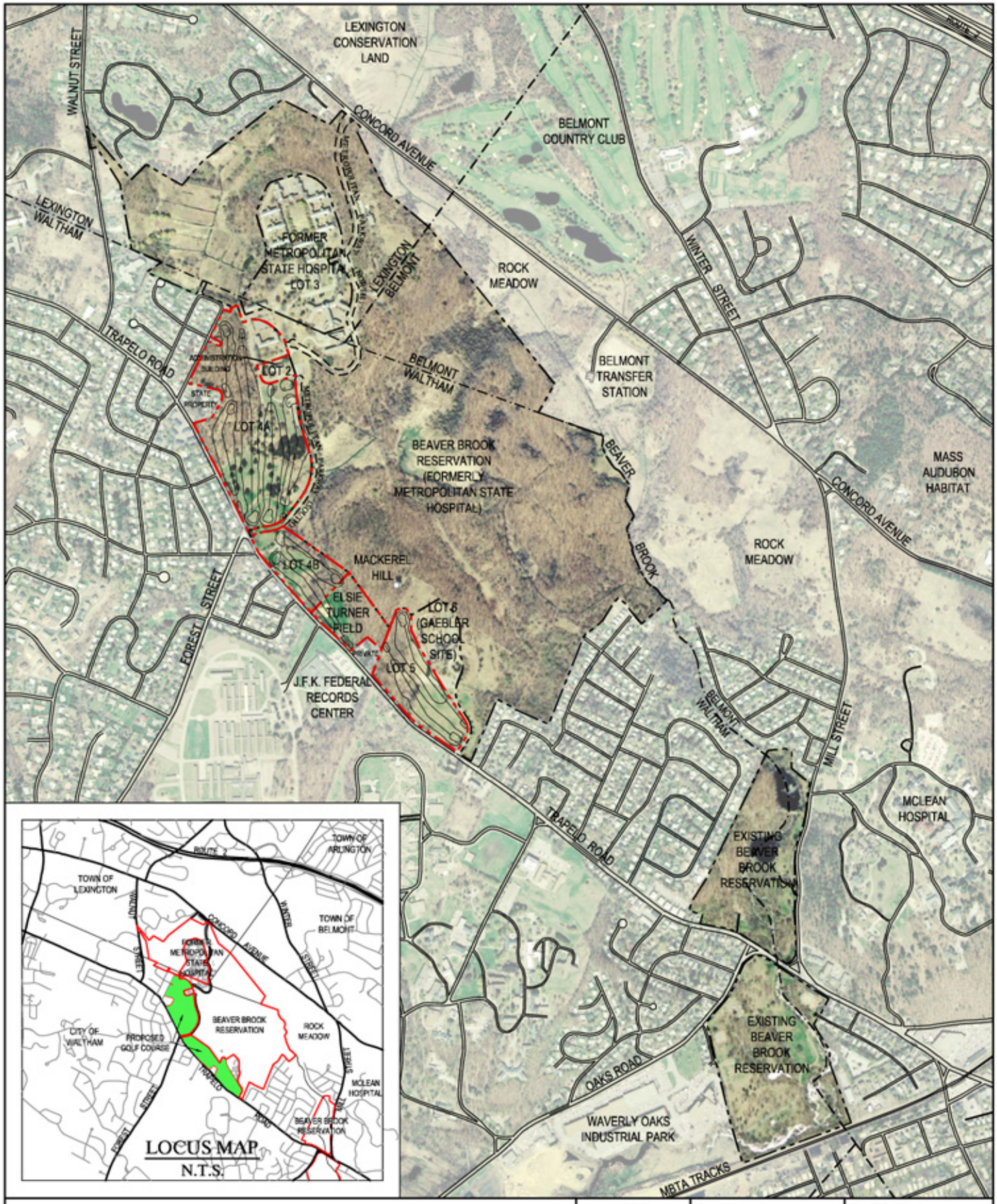


Expanded Beaver Brook Reservation RMP

City of Waltham Proposed 9-Hole Golf Course

Figure 1 - Overall Location Plan

NORTH

November 18, 2005

Scale: 1"=1200'

Prepared For:

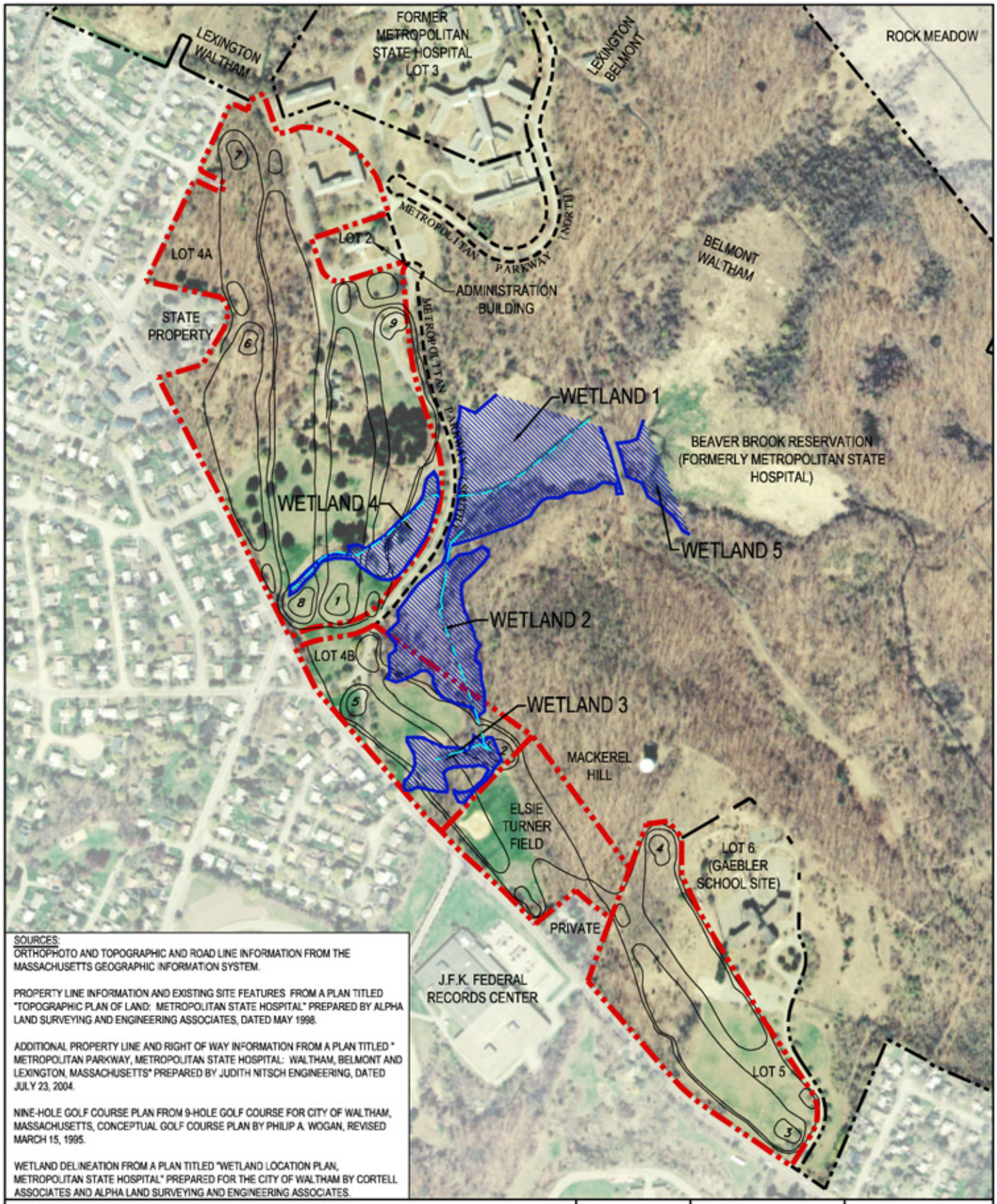
dcr

Massachusetts Department of Conservation and Recreation

Prepared By:

Pressley Associates, Inc. Landscape Architects

LEC ENVIRONMENTAL CONSULTANTS, INC.



SOURCES:
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PROPERTY LINE INFORMATION AND EXISTING SITE FEATURES FROM A PLAN TITLED "TOPOGRAPHIC PLAN OF LAND: METROPOLITAN STATE HOSPITAL" PREPARED BY ALPHA LAND SURVEYING AND ENGINEERING ASSOCIATES, DATED MAY 1998.

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Expanded Beaver Brook Reservation RMP

City of Waltham Proposed 9-Hole Golf Course

Figure 2 - Wetlands Location Plan

NORTH

November 18, 2005

Scale: 1"=500'

Prepared For:

dcr

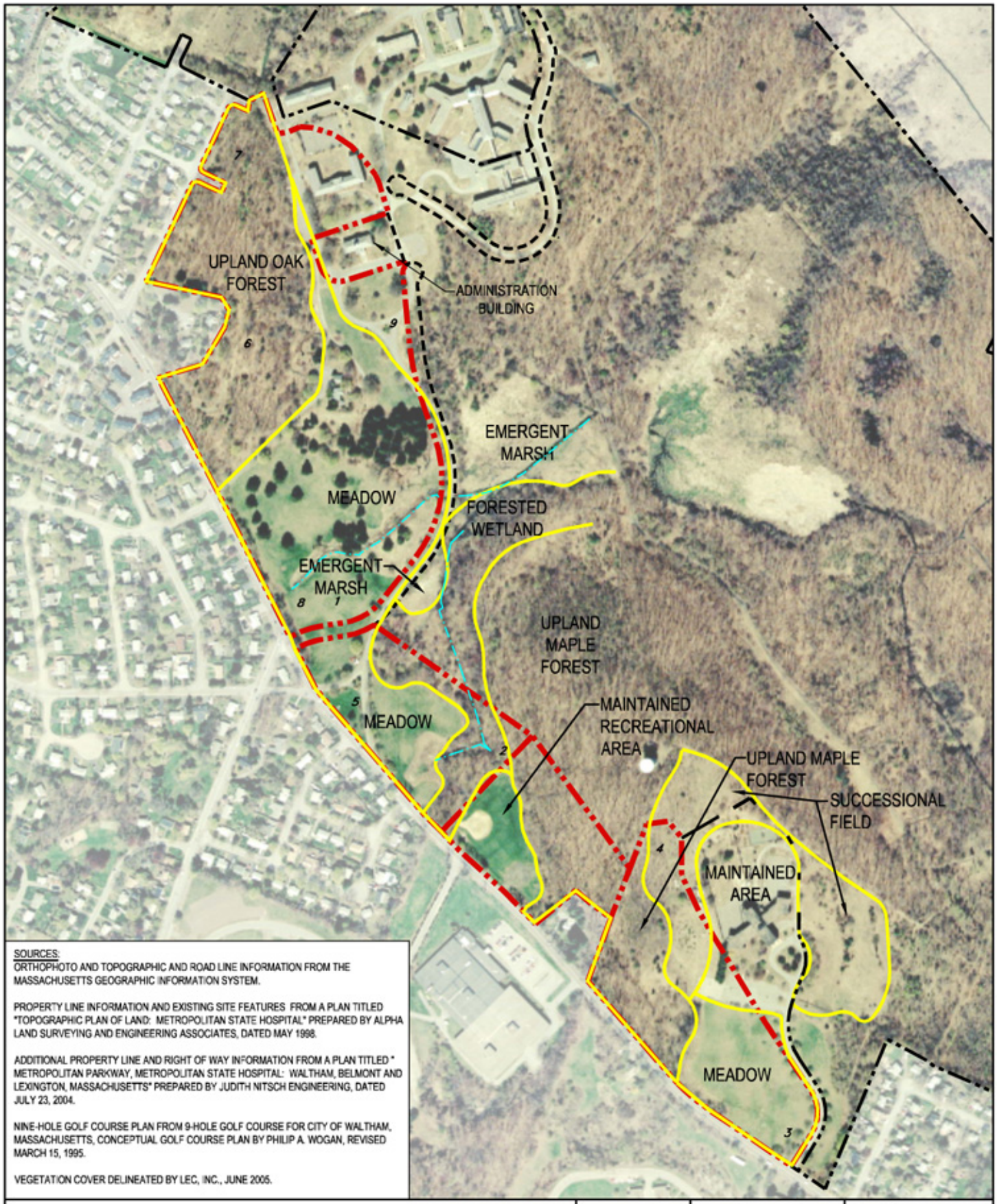
Massachusetts Department of Conservation and Recreation

Prepared By:

Pressley Associates, Inc.

LEC

ENVIRONMENTAL CONSULTANTS, INC.



SOURCES:
ORTHOPHOTO AND TOPOGRAPHIC AND ROAD LINE INFORMATION FROM THE MASSACHUSETTS GEOGRAPHIC INFORMATION SYSTEM.

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NINE-HOLE GOLF COURSE PLAN FROM 9-HOLE GOLF COURSE FOR CITY OF WALTHAM, MASSACHUSETTS, CONCEPTUAL GOLF COURSE PLAN BY PHILIP A. WOGAN, REVISED MARCH 15, 1995.

VEGETATION COVER DELINEATED BY LEC, INC., JUNE 2005.

Expanded Beaver Brook Reservation RMP

City of Waltham Proposed 9-Hole Golf Course

Figure 3 - Vegetation Cover Plan

NORTH

November 18, 2005

Scale: 1"=500'

Prepared For:

dcr

Massachusetts Department of Conservation and Recreation

Prepared By:

Pressley Associates, Inc.

LEC

ENVIRONMENTAL CONSULTANTS, INC.

SOURCE: GOLF COURSE DESIGN BY CAROL R. JOHNSON ASSOCIATES (SCHEME #5).

Expanded Beaver Brook Reservation RMP

City of Waltham Proposed 9-Hole Golf Course

Figure 4 - Golf Course Plan Scheme 5

NORTH

November 18, 2005

Scale: N.T.S.

Prepared For:

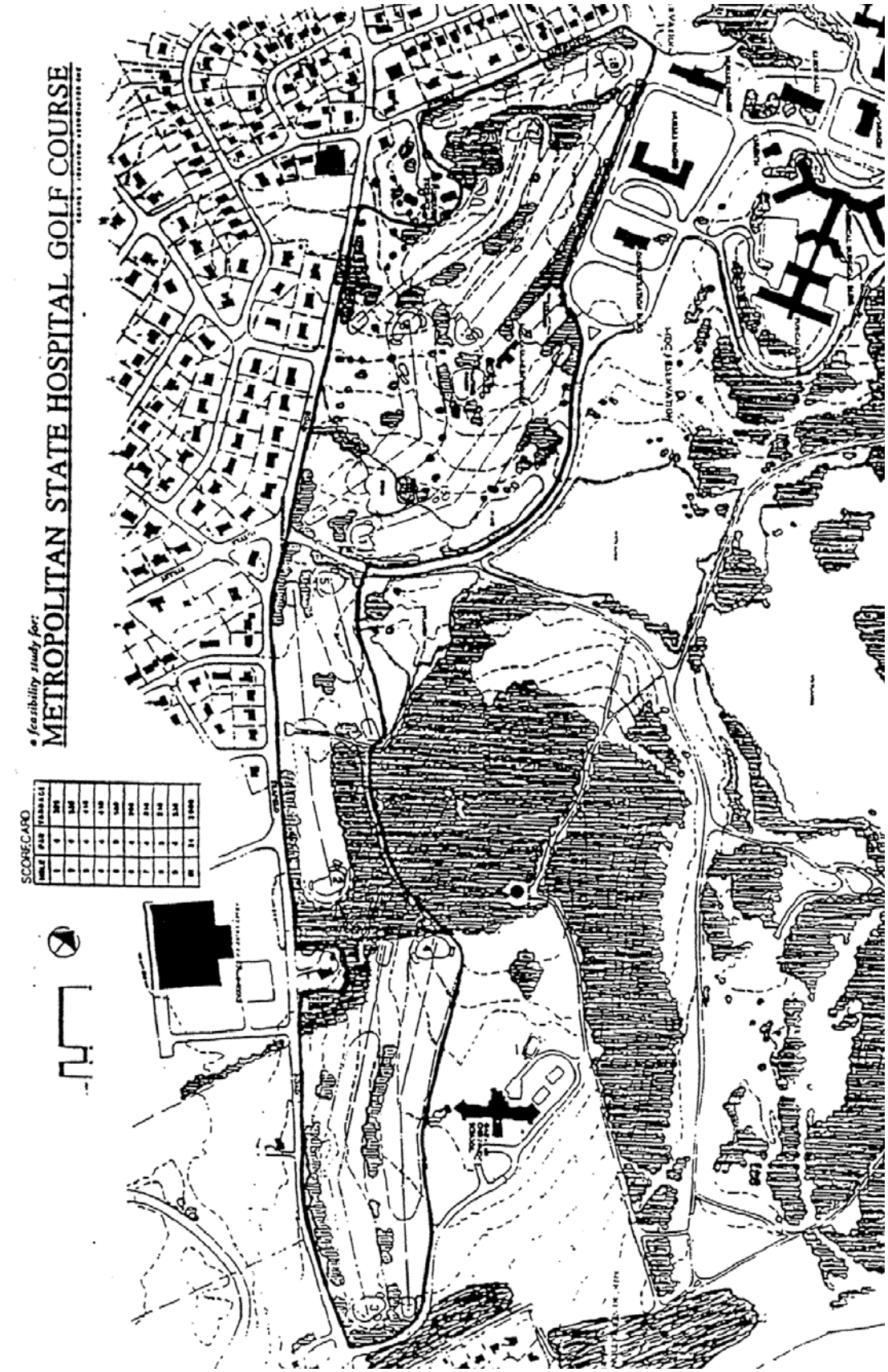
dcr

Massachusetts Department of Conservation and Recreation

Prepared By:

Pressley Associates, Inc. Landscape Architects

LEC ENVIRONMENTAL CONSULTANTS, INC.



SOURCE:
APPENDIX C IN GOODY, CLANCY AND ASSOCIATES, ET AL: "METROPOLITAN STATE HOSPITAL REUSE PLAN," COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF CAPITAL PLANNING AND OPERATIONS, OFFICE OF REAL ESTATE MANAGEMENT, JUNE 1994.

Expanded Beaver Brook Reservation RMP

City of Waltham Proposed 9-Hole Golf Course

Figure 5 - Appendix C Golf Course Plan

NORTH

November 18, 2005

Scale: N.T.S.

Prepared For:

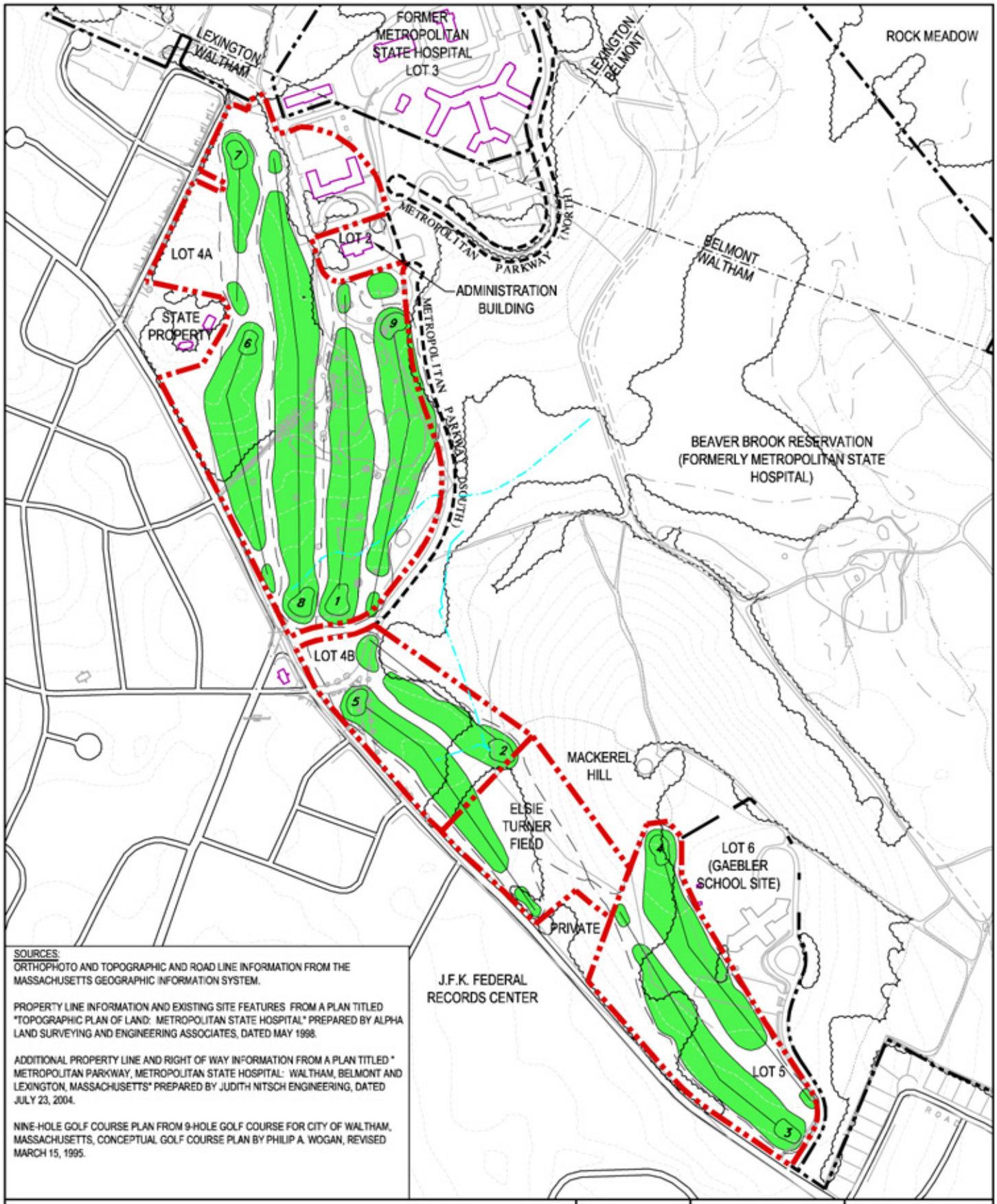
dcr

Massachusetts Department of Conservation and Recreation

Prepared By:

Pressley Associates, Inc. Landscape Architects

LEC ENVIRONMENTAL CONSULTANTS, INC.



SOURCES:
ORTHOPHOTO AND TOPOGRAPHIC AND ROAD LINE INFORMATION FROM THE MASSACHUSETTS GEOGRAPHIC INFORMATION SYSTEM.

PROPERTY LINE INFORMATION AND EXISTING SITE FEATURES FROM A PLAN TITLED "TOPOGRAPHIC PLAN OF LAND: METROPOLITAN STATE HOSPITAL" PREPARED BY ALPHA LAND SURVEYING AND ENGINEERING ASSOCIATES, DATED MAY 1998.

ADDITIONAL PROPERTY LINE AND RIGHT OF WAY INFORMATION FROM A PLAN TITLED " METROPOLITAN PARKWAY, METROPOLITAN STATE HOSPITAL: WALTHAM, BELMONT AND LEXINGTON, MASSACHUSETTS" PREPARED BY JUDITH NITSCH ENGINEERING, DATED JULY 23, 2004.

NINE-HOLE GOLF COURSE PLAN FROM 9-HOLE GOLF COURSE FOR CITY OF WALTHAM, MASSACHUSETTS, CONCEPTUAL GOLF COURSE PLAN BY PHILIP A. WOGAN, REVISED MARCH 15, 1995.

Expanded Beaver Brook Reservation RMP

City of Waltham Proposed 9-Hole Golf Course

Figure 6 - Golf Course Layout Plan

NORTH

November 18, 2005

Scale: 1"=500'

Prepared For:

dcr

Massachusetts Department of Conservation and Recreation

Prepared By:

Pressley Associates, Inc.

LEC

ENVIRONMENTAL CONSULTANTS, INC.

dcr
Massachusetts

Appendix D

Summaries of Meeting Notes from Public Review Process

First Public Meeting
Expanded Beaver Brook Reservation Resource Management Plan

Location: Massachusetts Audubon Society
Habitat Education Center
9 Juniper Road
Belmont, MA 02478

Date: March 7th, 2006

Present:
State officials, DCR staff, and consultants
State Representative Anne Paulsen
Dan Driscoll, DCR Senior Project Manager; Leslie Luchonok, DCR RMP Program Director; Richard Stewart, DCR Fells District Manager
Marion Pressley, Principal, Lauren Meier, Project Manager, and Swaathi Joseph, Landscape Designer, Pressley Associates; Richard Kirby, LEC Environmental

Approximately thirty individuals from Belmont, Waltham and Lexington signed in, representing the Waltham Land Trust, City of Waltham, Belmont Citizen-Herald, New England Mountain Bike Association, Belmont Land Trust, Judith K. Record Fund, Belmont Conservation Commission, Waltham City Council, and Massachusetts Audubon Society.

Introduction
The meeting began with opening remarks from Dan Driscoll, who thanked Mass Audubon and the constituents of Belmont, Waltham and Lexington who rallied to protect the former Met State Hospital land as open space. Dan also reviewed the meeting goals and agenda. Leslie Luchonok summarized the basics of the Resource Management Plan Process. Dan Driscoll gave an update on the current status of the Metropolitan State Hospital land including land disposition and current development activities such as the parkway construction, Avalon Bay development, demolition and site clean up on DCR land, and Waltham's proposed golf course.

Presentation
Lauren Meier of Pressley Associates and Richard Kirby of LEC Environmental followed DCR with a PowerPoint presentation of the findings to date. This included the following topics:

- RMP project area – historic Beaver Brook Reservation (59 acres), DCR portion of the former Metropolitan State Hospital (254 acres) and the DCR conservation restriction on the City of Waltham proposed golf course (54 acres)
- RMP objectives
- Summary of preliminary findings for the historic Beaver Brook Reservation
- Summary of preliminary findings for the former Met State Hospital land
- Summary of preliminary findings for the City of Waltham land
- Preliminary findings for natural resources
  - Habitat inventory
  - Plant community composition
  - Invasive species analysis
  - Wildlife habitat
  - Rare species habitat
- Preliminary findings for cultural resources
- Preliminary findings for recreational resources
- Preliminary findings for adjacent open space
- Preliminary findings for DCR management and operations
- Next steps for the RMP:
  - Complete analysis and prepare recommendations

- Public review draft open for review and comment
- Preparation of final draft

Dan Driscoll, DCR Senior Project Manager, was identified as the primary DCR contact person for the RMP project.

Discussion Topics

Water tower – the discussion focused on the current contract for the existing cell tower, which is attached to the water tower and alternatives for Mackerel Hill if the water tower is removed. According to Dan Driscoll, funds generated by the cell tower lease go to DCAM rather than DCR.

Additional 8 acres added to Waltham's land purchase on the Lexington/Waltham town line, where the existing Female Dormitory is located. Now the DCR land encloses the proposed Avalon Bay development and Waltham has not yet determined what they will do with the dormitory building.

Electric poles – what to do? DCR is trying to get DCAM to remove them as they are no longer functional. Utility lines extending to the new Avalon Bay development have been placed under the parkway.

MetFern Cemetery – on site damage requires immediate stabilization; long term management should focus on the Cemetery as a historic feature with respectful memorialization and an edge treatment that provides for future protection & demarcation.

Parkway:

- Additional gravel is present onsite as a result of the ongoing construction, the project required a 500% increase in blasting due to bedrock.
- Question: Have plans for roadways changed from what was originally designed? Answer: Yes. Trees will be planted along the parkway along with historically appropriate lights.
- Question: If the golf course is not developed, will the parking lot still be developed that connects the two access roads? Answer: Even if Waltham does not build the golf course, they are required to take down the female dormitory and build the parking lot connecting the N&S parkways. If the City fails to do this, DCAM will build the parking lot and send the bill to Waltham.

Waltham's proposed golf course

- Question: Did the evaluation consider any options for another less recreational use or another golf course, such as Frisbee golf, that would have less impact? Answer: The evaluation focused on the environmental impacts of the proposed golf course in comparison to conservation land.
- If the golf course is not built, Waltham will retain the land but will be required to coordinate with DCR for passive recreational use.
- The golf course can be built by a private entity, but must remain open to the public (Waltham citizens)
- During the land disposition process with DCAM, 3 people per community were involved in the review. The golf course review committee emphasized use of Best Management Practices (BMPs).
- The time limit for the City of Waltham to construct the golf course was originally 5 years, and is now extended to 7 years.

RMP schedule

- Draft – May 10 public review draft with a 30 day comment period.
- Final draft RMP – June 30

Rare species, wetlands, habitats

- Question: Were any rare species observed onsite? Answer: Species identified were based on cursory review of habitat conditions.
- Some discussion of other observations by local individuals. A Bentley College professor identified spotted turtles in 1990s. Other individuals have additional information on birds observed.
- Some information is available on historical wetlands.
- Discussion of potential partnerships with educational institutions – collaboration for continued monitoring and data gathering.

Western Greenway

- RMP should include an interpretive trail map that shows the connection to the larger Western Greenway Trail.

Current public access

- There is currently no public access from Trapelo Road and Concord Avenue due to parkway construction. Individuals can enter the parkland from Elsie Turner Field and Rock Meadow. No access to the Avalon Bay Development, which is currently still under DCAM jurisdiction, but will become private property.

Recreation policy

- According to Dan Driscoll, the recreation policy for the new 254-acre portion of the Reservation will be implemented in the context of protecting and preserving the resources of the property.
- Question: What about trying to balance recreation uses with resource protection? Answer from Dan Driscoll: at no time will be the ecosystem be compromised to accommodate inappropriate recreational uses. Mountain biking may be allowed on selected trails but will be subject to specific seasonal environmental conditions.
- The RMP establishes an overall framework and guidelines for managing the property, but specific uses and management of the property will need to evolve and adapt as public access and recreational use increase, and also in relationship to available DCR management resources.

Lack of physical connection

- The two properties are not contiguous, but are connected by the Beaver Brook.
- Laws governing stream buffer vegetation – Rivers Protection Act/Rivers Bill – Aug. 1996.
- DCR has in the past pursued easements along the brook corridor with a conservation easement – 15 to 20 feet
- Local Conservation Commission has jurisdiction over stream buffers

Geologic features

- Discussion of existing potential eskers on site.

Mosquito control

- Information exists on previous mosquito control work done on Met State land.

Poison Ivy

- Question: Will it be controlled? Dan Driscoll response: Only along authorized trails.

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Appendix E

DCR Rules and Regulations

Commonwealth of Massachusetts
Department of Conservation and Recreation

dcr

RULES AND REGULATIONS

350 CMR 2.01; Government and Use of the Reservations and Parkways Under the Care and Control of the Department of Conservation and Recreation.

(1) Definition of Reservations and Parkways

Reservations and Parkways shall include all boulevards, roadways, driveways, bridges, structures, land, beaches, ponds, lakes, rivers and other waters under the care and control of the Department of Conservation and Recreation.

(2) Rules and Regulations

(a) Entrance on and exit from reservations, parkways or waterways by vehicular traffic shall be made over designated areas only.

(b) No person is allowed on DCR Reservations except during the hours from dawn to dusk unless specified otherwise at the site, or by permit. Use of Parkways and bridges is not restricted.

(c) The DCR may post rules restricting recreational activity to designated areas and times.

(d) Cookouts shall be allowed only in places designated: and the use of grills, hibachis, and other apparatus for cooking is permitted subject to the direction of an Authorized Police Officer or DCR Ranger. Picnics are allowed except in those areas where expressly prohibited. Open fires are prohibited except by permit from the Commissioner or his designee.

(e) Drunkenness, breach of peace, profanity, amplified sound, or disorderly conduct offensive to the general public are strictly forbidden. Possession of alcoholic beverages is forbidden, except when authority has been granted by the Commissioner in writing.

(f) No person shall willfully obstruct the free passage of vehicles or persons.

(g) No person shall cause of permit any animal owned by him or in his custody or under his control, except a dog when restrained by a leash not exceeding seven feet in length to roam or be at large in, on, or through any reservation or parkway, or to be hitched or tied to a fence, tree, bush, shrub, or any object or structure except as otherwise provided, nor ride or drive a horse or animal not well broken and under proper control and then only on such roadways or bridle paths where authorized; nor neglect to refuse to stop, place, change, or move the position of said horse or animal as directed by an Authorized Police Officer or DCR Ranger. Owners are required to properly dispose of their dog's animal waste.

(h) The use of bicycles, or other means of transportation including in line skating may be prohibited in areas so designated on a site by site basis.

(i) No person, except in an emergency, shall bring, land, or cause to descend within any reservation or parkway any airplane, parachute or other apparatus of aviation except by written permit from the Commissioner or his designee.

(j) No person shall injure, deface, destroy, remove or carry off any sign, structure, facility, tree or any other property or equipment, real or personal, under the care and control of the Department of Conservation and Recreation.

(k) Parades, games, fairs, carnivals, bazaars, gifts or solicitations for raising or collecting funds shall not be permitted without written Commissioner approval.

(l) Lotteries, raffles, gambling and games of chance are prohibited; and no person shall have possession of machinery, instruments or equipment of any kind for use for these purposes on DCR property.

(m) Public assemblies of more than 25 persons shall not be allowed without a written permit from the Commissioner or his designee.

(n) No person shall engage in any business, sale or display of goods or wares without a written permit from the Commissioner or his designee.

(o) All signs and advertising are prohibited on DCR property without a written permit from the Commissioner.

(p) No person, unless authorized by law or permit, shall have possession of or discharge arty weapon, firearm, fireworks or other explosive.

(q) Hunting or trapping of animals or birds shall not be permitted unless specifically authorized by law, including the Colonial Ordinances of 1641-47, or by the Commissioner. Injuring or otherwise disturbing animals or birds or their habitat is prohibited.

(r) No person shall drop, throw, or place and allow to remain any litter, garbage, or other effuse, except in the receptacles provided; nor throw a lighted match, cigarette butt or any other burning substance on the ground or in said receptacles; nor bring or cause to be brought within any reservation or parkway any garbage, refuse or material for the purpose of dumping, or deposit same within said receptacles.

(s) No person shall drop, throw or place any litter, garbage or refuse in any of the rivers or waters under the care and control of the DCR, or in any other way pollute or contribute to the pollution of such rivers and waters.

(t) No person shall refuse or neglect to obey any posted regulatory sign or the lawful directions of an Authorized Police Officer, DCR Ranger or person in charge.